

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer, the first electrode contact layer comprising a Si/In-codoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer.

2. (Original) The device according to claim 1, wherein the second electrode contact layer is an n-type electrode contact layer.

3. (Original) The device according to claim 1, wherein the buffer layer comprises one selected from the group consisting of an InGaN/GaN super lattice

structure, an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure and an $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}/\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure.

Claim 4 (Cancelled)

5. (Original) The device according to claim 1, wherein the active layer comprises a single or multiple quantum well structure.

6. (Original) The device according to claim 1, wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

7. (Currently Amended) ~~The device according to claim 6, A nitride based~~
3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

8. (Currently Amended) ~~The device according to claim 6,~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

9. (Currently Amended) The device according to claim 6, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown in a spiral mode.~~

10. (Currently Amended) The device according to claim 6, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown in a spiral mode~~, and wherein the spiral mode surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

11. (Original) The device according to claim 1, wherein the second electrode contact layer comprises an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure.

12. (Currently Amended) ~~The device according to claim 1,~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer,

wherein the ~~low-mole~~ first In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ GaN layer and the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed thereon are repeatedly layered in plurality.

13. (Currently Amended) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

a first electrode contact layer formed above the first In-doped GaN layer,

the first electrode contact layer comprising a Si/In-codoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

14. (Original) The device according to claim 13, wherein the second electrode contact layer is an n-type electrode contact layer.

15. (Currently Amended) The device according to claim 13, further comprising a second In-doped GaN layer formed between the active layer and the ~~p-type~~ GaN layer, and the GaN layer is p-type.

16. (Currently Amended) ~~The device according to claim 13, further comprising~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed ~~between~~ above the first In-doped GaN layer layer; ~~and the first electrode contact layer~~

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

17. (Currently Amended) ~~The device according to claim 13, further comprising~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure and an undoped GaN layer ~~between~~ formed above the first In-doped GaN layer layer; and the first electrode ~~contact layer~~

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure and an undoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

18. (Currently Amended) The device according to claim 13, wherein the buffer layer comprises one selected from the group consisting of an InGaN/GaN super lattice structure, an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure and an $\text{Al}_x\text{In}_y\text{Ga}_{1-x,y}\text{N}/\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure.

Claim 19 (Cancelled)

20. (Original) The device according to claim 13, wherein the active layer comprises a single or multiple quantum well structure.

21. (Original) The device according to claim 13, wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

22. (Currently Amended) ~~The device according to claim 21,~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

a first electrode contact layer formed above the first In-doped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

23. (Currently Amended) ~~The device according to claim 21, A nitride~~
based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

a first electrode contact layer formed above the first In-doped GaN layer;

an active layer formed above the first electrode contact layer and
functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well
structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer
and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the
 $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed
as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

24. (Currently Amended) The device according to claim 21, wherein the
low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown~~
~~in a spiral mode.~~

25. (Currently Amended) The device according to claim 21, wherein the
low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown~~

~~in a spiral mode~~, and wherein the spiral mode surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

26. (Original) The device according to claim 13, wherein the second electrode contact layer comprises an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure.

27. (Withdrawn, Currently Amended) A fabrication method of a nitride based 3-5 group compound semiconductor light emitting device, comprising:

forming a buffer layer above a substrate;

forming a first In-doped GaN layer above the buffer layer;

forming a first electrode contact layer above the first In-doped GaN layer,

the first electrode contact layer comprising a Si/In-codoped GaN layer;

forming an active layer for emitting light above the first electrode contact layer;

forming a GaN layer above the active layer; and

forming a second electrode contact layer above the GaN layer.

28. (Withdrawn) The fabrication method according to claim 27, wherein the second electrode contact layer is an n-type electrode contact layer.

Claim 29 (Cancelled)

30. (Withdrawn) The fabrication method according to claim 27, wherein

the second electrode contact layer comprises an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer.

31. (Withdrawn) The fabrication method according to claim 27, wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

32. (Withdrawn) The fabrication method according to claim 31, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer is grown to have a surface configuration in a spiral mode.

33. (Withdrawn) The fabrication method according to claim 31, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer is grown into a surface configuration of a spiral mode, wherein the spiral mode is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

34. (Currently Amended) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first electrode contact layer formed above the $[\text{GaN}]$ buffer layer, the first electrode contact layer comprising a Si/In-codoped GaN layer;

an active layer formed above the first electrode contact layer, and including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

35. (Original) The device according to claim 34, wherein the second electrode contact layer is an n-type electrode contact layer.

36. (Currently Amended) ~~The device according to claim 34,~~ A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first electrode contact layer formed above the buffer layer;

an active layer formed above the first electrode contact layer, and including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,

wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

37. (Currently Amended) ~~The device according to claim 34, A nitride based 3-5 group compound semiconductor light emitting device comprising:~~

a substrate;

a buffer layer formed above the substrate;

a first electrode contact layer formed above the buffer layer;

an active layer formed above the first electrode contact layer, and including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,

wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

38. (Currently Amended) The device according to claim 34, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown in a spiral mode.~~

39. (Currently Amended) The device according to claim 34, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration ~~that is grown in a spiral mode~~, wherein the spiral mode surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.